

***Argiolestes* in the Bismarck and the Solomon Archipelagos. Notes on Old World Megapodagrionidae 2 (Odonata)**

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Key words: Odonata, dragonfly, Zygoptera, *Argiolestes*, taxonomy, Bismarck Archipelago, Solomons.

ABSTRACT

Argiolestes aurantiacus, endemic to the Bismarck Archipelago, is redescribed and three new species of *Argiolestes* from the Solomon Archipelago are described: *A. bougainville* sp. nov. (holotype ♂: Papua New Guinea, Bougainville, North Solomons, 02 i 1970), *A. gizo* sp. nov. (holotype ♂: Solomon Islands, Western Province, Gizo Island, alt. 1-100 m, 02 vii 1959) and *A. malaita* sp. nov. (holotype ♂: Solomon Islands, Malaita, Tagatalau, east of Auki, alt. 200 m, 27 ix 1957). The holotypes are deposited in the RMNH.

INTRODUCTION

The Bismarck and Solomon Archipelagos are two island groups to the north and east of New Guinea (Fig. 1). The Bismarck Archipelago is politically part of Papua New Guinea and includes two large islands, New Britain and New Ireland. The Solomon Archipelago consists of seven larger and numerous smaller islands. The largest is Bougainville, politically belonging to Papua New Guinea, while the others constitute the Solomon Islands nation. The island groups have different geological histories, the Solomon Archipelago being older (Allison 1996). Most species and genera found on the islands are shared with mainland New Guinea although the Solomon Archipelago especially has a high percentage of endemic species.

New Britain and New Ireland have 43 odonate species (41 on New Britain and 19 on New Ireland) with 11 endemic to New Britain and none to New Ireland. The monotypic genus *Titanosticta* Donnelly, 1993 (Isostictidae) is endemic to New Britain, while the two species of *Cnemisticta* Donnelly, 1993 (Isostictidae) are shared between New Britain and the Solomon Archipelago. Papers specifically dealing with odonates of the Bismarck Archipelago include Ris (1898) and Lieftinck (1949a).

In total 59 species of odonates are known from the Solomon Archipelago, of which 24 are endemic. Four genera are endemic to the Solomon Archipelago: *Lieftinckia* Kimmins, 1957 (Platycnemididae) with six species and three monotypic genera *Salomocnemis* Lieftinck, 1987 (Platycnemididae), *Guadalca* Kimmins, 1957 (Cordu-

liidae) and *Tapeinothemis* Lieftinck, 1950 (Libellulidae). Papers on the odonates of the Solomon Archipelago published since Lieftinck's 'Synopsis of the Odonate fauna of the Bismarck Archipelago and the Solomon islands' (Lieftinck 1949a) include Donnelly (1993), Kimmins (1957, 1959), Lieftinck (1963, 1987), Yule (1993, 1995a, 1995b, 1996) and Yule & Pearson (1996).

Thirty-five species of the megapodagrionid genus *Argiolestes* Selys, 1862 are known from New Guinea and adjacent small islands. Only one is known from the Bismarck Archipelago (*A. aurantiacus* Ris, 1898) and none from the Solomon Archipelago. Recently, material representing three new species of *Argiolestes*, previously studied by Lieftinck, but still unpublished, was found in the collection of the RMNH. These species are described here. All species of *Argiolestes* occurring on New Guinea and the Moluccas were either redescribed and illustrated by Lieftinck (1935, 1938, 1949b, 1956) or more recently by Theischinger & Richards (2006, 2007) and Englund & Polhemus (2007). However, *A. aurantiacus*, described from two males from the Bismarck Archipelago, was never studied by Lieftinck and its characters were never illustrated. Based on new material, the male of *A. aurantiacus* is redescribed and the first description of the female is presented.

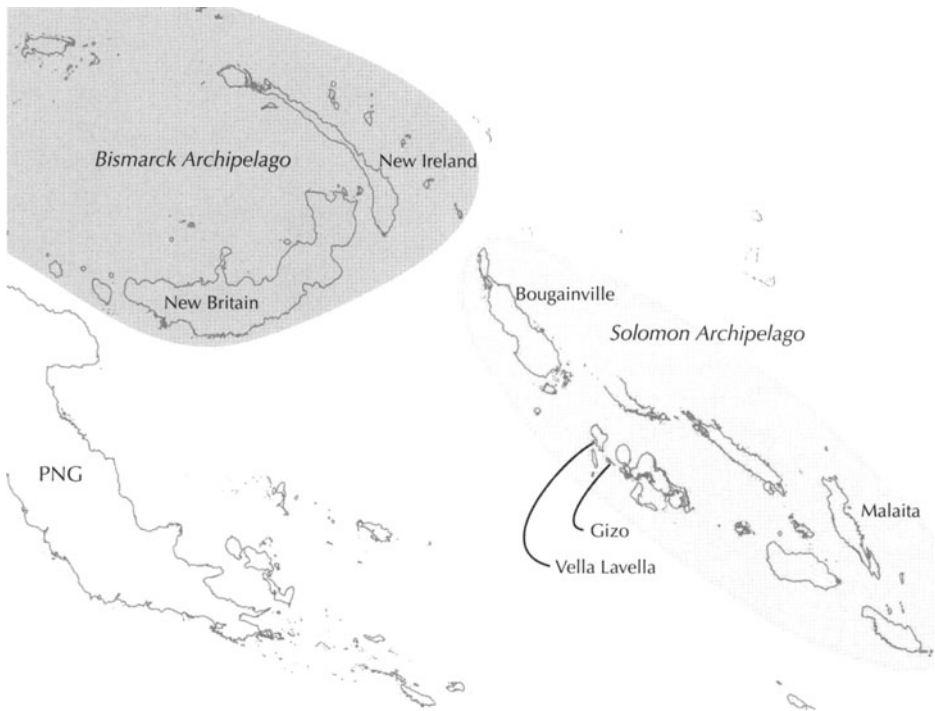


Figure 1: The Bismarck and Solomon Archipelagos and islands mentioned in the text.

MATERIAL AND METHODS

A list of specimens studied is given at the beginning of the species descriptions. The specimens of *Argiolestes gizo* and *A. malaita* were collected by J.L. Gressitt and presented to M.A. Lieftinck. Photos using Scanning Electron Microscopy were made of the penis of *A. aurantiacus* and *A. gizo* sp. nov. by D. Gassmann. Terminology largely follows Watson & O'Farrell (1991).

Acronyms for collections:

BMNH — Natural History Museum, London

BPBM — Bishop Museum, State Museum of Natural and Cultural History, Honolulu

CUMZ — Cambridge University Museum of Zoology

MNHU — Museum für Naturkunde der Humboldt-Universität, Berlin

RMNH — Nationaal Natuurhistorisch Museum Naturalis, Leiden

SAM — South Australian Museum, Adelaide

ZMUC — University of Copenhagen, Zoological Museum, Copenhagen

Argiolestes aurantiacus Ris, 1898

(Fig. 2)

A. aurantiacus Ris was described without illustrations as *Argiolestes aurantiaca* based on two males (one teneral) from 'Bismarck-Archipel' collected by Prof. Friedrich Dahl. The original publication gives no further details of collecting date or locality but the label of the type (Fig. 2b) shows that it was collected on 7 January 1897 at 'Ratum, Neu-Britannien', which was a European settlement near Kokopo at the northeastern tip of New Britain. The only new information published since is the record of two males collected on New Britain by A. Willey during an expedition in 1895-1897 and deposited in the Cambridge University Museum of Zoology (CUMZ) (Campion 1919). Eight males of *Argiolestes* collected on New Britain and one male collected on New Ireland present in the RMNH and BMNH were compared with the type (MNHU) and all proved to belong to *A. aurantiacus*. Based on this material the male is redescribed, and the female is described for the first time.

Specimens studied

Holotype ♂ (teneral, S7-10 and appendages missing); Paratype ♂: Papua New Guinea, East New Britain, Ratum, 07 i 1897, leg. F. Dahl, MNHU. — 2 ♂: Papua New Guinea, East New Britain, small creek near Vunakore (4°25'48.09"S, 152°08'34.3"E), 13 vi 1997, leg. D. Gassmann, RMNH. — 3 ♂, 4 ♀: Papua New Guinea, East New Britain, Yalom, 1,000 m, 18-19 v 1962, leg. Noona Dan Expedition 1961-62, ZMUC. — 1 ♂: Papua New Guinea, East New Britain, Komgi, 1,000 m, 14 v 1962, leg. Noona Dan Exp. 61-62, ZMUC. — 1 ♂: Papua New Guinea, West New Britain, Metelen River, 32 km SE of Ruango, vii 1970, leg. Jindrich, RMNH. — 1 ♂ [appendages missing]: Papua New Guinea, East New Britain, Upper Warangoi River, 300 m, 06 xii 1962, leg. J. Sedlacek, RMNH. — 2 ♀: Papua New Guinea, East New Britain, Above Ti, Nakanai Mts, 1700 m, 30 vii 1956, leg. E.J. Ford, RMNH. — 1 ♂: Papua New Guinea, New Britain, 1917-1919, leg. A. Willey, BMNH. — 1 ♂: Papua New Guinea, New Ireland, Kandan, 27 xii 1959, leg. W.W. Brandt, RMNH.

Other specimens

The following specimens of *Argiolestes aurantiacus* were seen by Günther Theischinger and identified by him based on the description given in this article.

2 ♂, 1 ♀: Papua New Guinea, East New Britain, Wanui Camp and nearby garden site (05°21.638'S, 152°05.266'E), 14 iii 2000, leg. S. Richards, SAM. — 3 ♂, 1 ♀: idem, 20 iii 2000, leg. S. Richards, SAM.

Diagnosis

With the exception of *A. aulicus* for which only the female is known, males can be distinguished from all other species of *Argiolestes* by the combination of the following characters: (1) posterior border of S10 dorsally with a row of small spines mainly placed in the centre, spines are sometimes obscure and scarcely visible; posterior border never with a single large spine; (2) sides of synthorax pale brown without a clearly defined dark pattern and never dark with pale pattern; (3) thorax and face largely orange, brown or black and never with extensive blue or green.

Redescription of male

Head: Labium whitish to orange brown; wider (1.5 mm) than long (1.1 mm), median cleft slightly less than $\frac{1}{4}$ of the length of labium and about $\frac{2}{3}$ as wide as deep (Fig. 2c). Labrum dark with blue or green metallic shine; anteclypeus white to brown, in most specimens distinctly paler than remainder of head; postclypeus shining dark brown to black. Front of face below antennae, including genae and mandibles, shining brown; frons and dorsum of head including antennae dark brown except for a diffuse paler area between lateral ocelli and base of antennae, and paler area in front of median ocellus. In some specimens these paler areas are largely obscured and hardly visible. Socket and first segment of antenna black, second segment brown and remainder black. The pattern on the head of the specimen from the Metelen River is aberrant: the sides of the postclypeus are whitish as is the side of the face along the eyes. Both are connected by a white area running below sockets of antennae; the lower corners of head dark brown. In the holotype (teneral) the face is pale brown throughout.

Thorax: Anterior lobe of pronotum brown; median lobe orange brown with sides brown; posterior lobe brown with free margin almost black, the latter broadly rounded and slightly concave in middle. Synthorax (Fig. 2d) laterally orange-brown and dorsally dark brown; posterior margins largely black. In some specimens the dark dorsal area is more restricted, in others more extensive, covering large parts of the mesepisternum. In the holotype male (teneral) the dorsum of the synthorax is completely pale; it seems that the dark pattern on the synthorax is age-related. — **Legs:** Dull orange without darker markings, spines orange and darker. Femora of fore, middle and hind legs with 9-10, 8-10 and 13-15 spines respectively; tibiae of middle and hind legs with 11-13 and 10-14 spines; spines near the knees almost three times as long as the space between the spines. — **Wings:** Wings hyaline or slightly suffused with yellow; veins brown to black (Fig. 2e). Fw and Hw of equal length. Wing with 2 Ax, 22-27 Px in Fw, 21-25 in Hw. Arculus at level of Ax2; discoidal cell in forewing long, costal side slightly less than 1.5 times as long as distal side, most

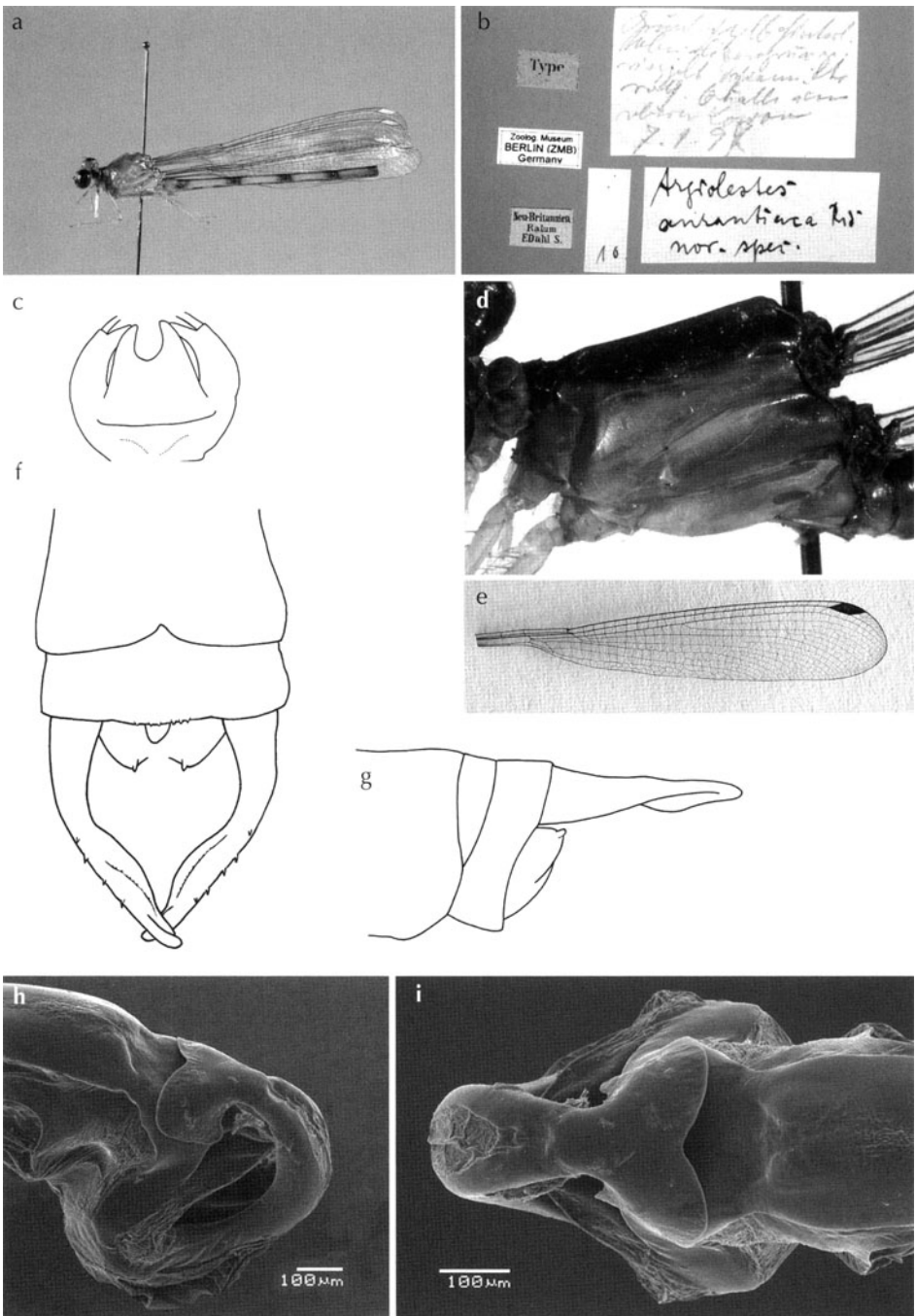


Figure 2: *Argiolestes aurantiacus* male, Papua New Guinea, New Britain — (a) photo of holotype; (b) holotype labels; (c) labium; (d) synthorax of paratype, lateral; (e) fore wing; (f) appendages, dorsal; (g) anal appendages, lateral; (h) penis, lateral; (i) penis, ventral.

acute angle about 30-40°. Ac at about ¼ distance from Ax1 to Ax2. Two cells between discoidal cell and subnodus. Brace vein present. Pterostigma dark brown with a very thin pale fringe and the inner border concave; the pterostigma is white in teneralis such as the holotype. A few (sometimes none) to most of the cells beyond Pt divided. Two rows of cells in anal field in Fw, three to four in Hw. Fields between IR2 and R3, between R3 and IR3, and between IR3 and R4 at distal end containing each three or more rows of cells.

Abdomen: Dorsum dark brown to black getting darker towards tip but S1 clearly paler and S10 in some specimens with a pair of paler orange brown dorso-lateral spots. The median dorsal parts of the tergites of S9 and anterior third of S8 is only lightly sclerotized and appears wrinkled. Ventral side and lower half of lateral side brownish, darker towards tip. Number of dorsal spines on hind border of S10 varies from scarcely any to a row of small denticulations situated mainly in the centre. Superior appendages (Figs 2f, g) dark brown to black with the base in some specimens slightly paler; laterally with several spines; inner side of superior appendage is expanded from the point where the appendages bend inwards and tapered again from the final ⅓ of the length before apex. This broadened area is flat and is dorsally bordered by a ridge of poorly defined denticles. Inferior appendages brown, shorter than S10, almost five times as short as superior appendages and ending in a small apically directed nipple. Penis as illustrated (Figs 2h, i).

Measurements [mm]: Entire length 44-49, abdomen 34-40, Fw 31-34, Fw pterostigma: 1.6-1.7 (costal length), 2.3-2.5 (longest length); Hw pterostigma: 1.8-2.0 (costal length), 2.4-2.6 (longest length).

Description of female

Head: Labrum, genae and mandibles brown, slightly shining; clypeus and remainder of head brown, darker towards dorsum.

Thorax: Synthorax brown throughout with only the posterior margins and the median carina thinly outlined with black. Legs: pale brown. Wings: Pterostigma brown; whitish brown in young specimens.

Abdomen: Brown becoming darker towards tip; the anterior and especially the posterior margins of the segments dark brown to black. In older specimens the posterior half of abdomen is largely dark brown to black.

Measurements [mm]: Entire length: 43-46, abdomen 32-35, Fw 31-33, Fw pterostigma 1.5-1.7 (costal length), 2.2-2.3 (longest length); Hw pterostigma 1.7-1.9 (costal length), 2.3-2.4 (longest length).

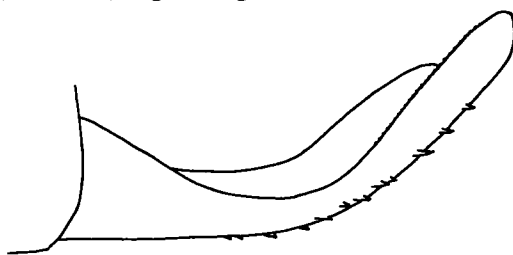


Figure 3: *Argiolestes bougainville* sp. nov. holotype, Papua New Guinea, Bougainville Island — left superior anal appendage, dorsal.

Argiolestes bougainville sp. nov.
(Fig. 3, Plate IIIa-c)

Etymology

Named after the island where the species occurs. A noun in apposition.

Specimens studied

Holotype ♂: Papua New Guinea, North Solomons, Bougainville, 02 i 1970, leg. R. Straatman, RMNH, handwritten text with pencil on envelope: "Argiolestes sp. nov. C, Solomon Is., Bougainville I., 2.1.1970, R. Straatman, Buin [the latter is difficult to read]."

Differential diagnosis

A. bougainville sp. nov. can easily be distinguished from other males of *Argiolestes* by its large size and its striking azure blue pattern on the thorax. The pattern of the thorax resembles that of *A. malaita* sp. nov. However in that species the colour is rusty orange instead of azure blue and the pattern on the head (see Plate IIIb) is different.

Description of holotype male

Head: Anterior $\frac{2}{3}$ of labium black to dark brown, posterior $\frac{1}{3}$ pale brown, wider (1.9 mm) than long (1.4 mm), median cleft slightly more than $\frac{1}{5}$ of the length of labium and about $\frac{2}{3}$ as wide as deep. Labrum, mandibles, genae, clypeus and sockets of antennae shining azure blue. The blue runs along the eyes towards dorsum of the head and runs from there towards the lateral ocelli. Frons and remainder of dorsum of head matt black (Plate IIIb). First two antennal segment mottled brown, remainder of antennae missing. Rear of head black and without prominent occipital lobes.

Thorax: Prothorax laterally brown with blue reflection. Anterior and median lobe of pronotum blue but especially median lobe darker than the blue on the head, posterior lobe brown. Synthorax black with an azure blue pattern as shown in Plate IIIc. — Legs, coxae and trochanters yellowish brown. Coxae on the outside largely brownish; femora with a black ring just above top and with black keel; tarsi brownish. Spines dark brown to black. Femora of front legs with five larger and six small spines on lateral side; femora of middle and hind legs with ten and thirteen spines on lateral side. All of them longer than space between spines. Tibiae of second and third pair of legs both with 10-12 spines on lateral side; near knees these spines are about three times as long as space between spines but become increasingly shorter towards tarsi. — Wings: Membrane hyaline, venation brown. Fw and Hw of equal length, both with 2 Ax, Hw with 25 and Fw with 26-27 Px. Arculus at height of Ax2. Discoidal cell in Fw long, costal side slightly more than three times as long as distal side, most acute angle between 50 to 60°. Ac slightly closer to Ax2 than to Ax1 and almost twice as far from arculus as the length of arculus. One to two cells between discoidal cell and subnodus. Brace vein present. Pterostigma pale brown. Two rows of cells between anal vein and hind border of wing. Fields between IR2 and R3, between R3 and IR3, and between IR3 and R4 at distal end each containing three or more rows of cells.

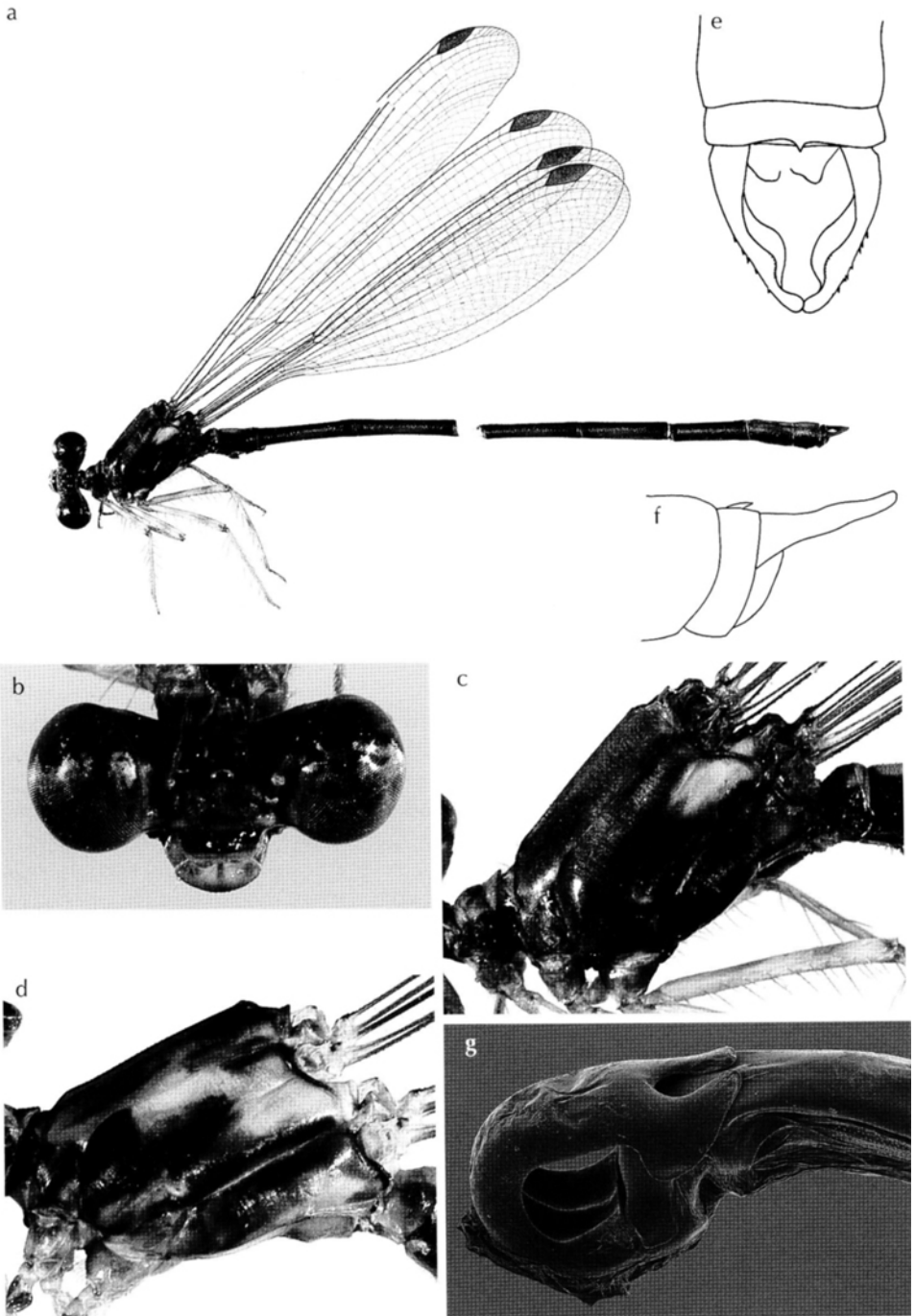


Figure 4: *Argiolestes gizo* sp. nov., Solomon Islands — (a) habitus of holotype; (b) head of holotype, frontal; (c) synthorax of holotype, lateral; (d) synthorax of teneral paratype male, lateral; (e) anal appendages of holotype, dorsal; (f) same, lateral; (g) penis of teneral paratype, lateral.

Abdomen: S1 largely blue, S2 brown with blue reflections in lower distal corner, S3-6 pale brown with apical 1/6 of each segment dark brown, S8-10 dark brown. Hind margin of S10 without spines and slightly depressed in the middle. Appendages as in Figure 3. Inferior appendages simple, slightly shorter than S10 and brown. Superior appendages brown; base of covered with minute spines. On lateral side of superior appendages numerous larger spines are present; on inner side of the apex a ridge is present bearing a number (10+) of black, blunt denticles. Below this ridge a second smaller ridge is present which curves back towards the main body of the appendages. The space between both ridges is somewhat hollowed out. The penis was not studied as only the holotype was available.

Measurements [mm]: Total length 59, abdomen 43, Fw 36, Fw pterostigma 1.4 (costal length), 1.9 (longest length); Hw pterostigma 1.6 (costal length), 2.0 (longest length).

Argiolestes gizo sp. nov.

(Fig. 4)

Etymology

Named after one of the islands where the species occurs. A noun in apposition.

Specimens studied

Holotype ♂ (adult): Solomon Islands, Western Province, Gizo Island, alt. 1-100 m, 11 vii 1959, leg. J.L. Gressitt, RMNH, text on envelope: "♂♀, *Argiolestes* sp. n. B. Solomon Is. New Georgia Group, Gizo I., 11.VII.1959, 1-100m, J.L. Gressitt," text on label: "Gizo, 20m, 11-VII-59." — **Seven paratypes**, 1 ♀ (subadult): same location and date as holotype; 1 ♂ (adult): Solomon Islands, Western Province, Gizo Island, low bush area in valley, 07/08 v 1975, leg. H.R. Wimmer, RMNH, printed text on label: "BRITISH SOLOMON ISLANDS: Gizo Island (Western Solomons); low bush area in valley, 7, 8 May 1975, Howard R. Wimmer, Collection U.S. National Museum;" 2 ♀ (one adult, one subadult): Solomon Islands, Vella Lavella, Western Province, Gingolo, leg. J.L. Gressitt, RMNH, text on label: "2♀ *Argiolestes* sp.n. B., Solomon Is. Vella Lavella, Gingolo, Gressitt, BISH;" 1 ♂ (subadult), 1 ♀ (subadult): Solomon Islands, Western Province, Mount Arewana, Vella Lavella, alt. 500 m, 16 xi 1963, leg. J.L. Gressitt, RMNH, text on envelope: "♂♀ *Argiolestes* sp. n. B., Solomon Is, Mt Arewana, Vella Lavella, 500m, 16.XI.1963, G., BISH," text on label attached to envelope: "Vella L. Mt. Arewana, 500m, 16.XI.63, G;" 1 ♂ (teneral): Solomon Islands, Western Province, Vella Lavella, Mount Arewana, alt. 100m, 16 xi 1963, leg: J.L. Gressitt, RMNH, text on envelope: "♂ *Argiolestes* sp. n. B., Solomon Is. Vella Lavella, Mt. Arewana, 100m, 16.XI.1963, Gressitt, BISH".

As in many other species of *Argiolestes* the coloration and to a lesser extent the pattern changes markedly with age. Judging from the shine of the wings one of the males from Vella Lavella is teneral. In this male the pale pattern on the abdomen and thorax are clearly visible and the pterostigma is very pale. It is therefore assumed that the darker specimens represent adults. A mature male was selected as holotype.

Diagnosis

The only *Argiolestes* known from Gizo and Vella Lavella. Can easily be distinguished from other species described thus far from the Solomon Archipelago and the Bismarck Archipelago by its small size and the presence of a single slightly raised spine, dorsally on the hind margin of S10.

Description of holotype male

Head: Labium reddish brown, posteriorly paler; slightly wider (1.3 mm) than long (1 mm), median cleft slightly longer than $\frac{1}{4}$ length of labium and almost twice as deep as wide. Rear of head of normal shape. Labrum dirty pinkish-white, upper corners slightly bluish, anterior margin with a poorly defined brownish stripe. Mandibles dirty pinkish-white, lower part brownish to blackish. A dirty yellowish-white band runs from outer corners of the clypeus to the eye, thence continues at right angles up along the eye margin to the level of the median ocellus. Genae and lower corners of the face below the pale markings shining black. Anteclypeus dirty pinkish-white, postclypeus matt black (Fig. 4b). Rear of head, including a small stripe on the hind margin of the dorsal part of head, dark orange-brown. Remainder of dorsum of head, including sockets of antennae and antennae, matt black.

Thorax: Sides of prothorax black; pronotum brown. Posterior lobe of pronotum broad, flat and only slightly raised, with rounded corners. The synthorax is black with only a few small, pale brown spots (Fig. 4c). — **Legs:** coxae and trochanters mottled brownish. Remainder of legs orange yellow with two faint black rings on femora – one near top and one just before the middle; these rings about as wide as the yellow area between them. The knees partly black. Spines orange-brown; femora with respectively 7-8, 6, 8-9 spines on lateral side; tibiae of first pair of legs with 3 larger and 9 smaller spines on the lateral side; tibiae of second and third pair of legs with 7-9 and 8-10 spines respectively on lateral side. — **Wings:** hyaline, venation black. One of the Fw has 3 Ax, other wings have 2. Fw with 19-20 Px; Hw with 16-17 Px. Arculus at level of second antenodal vein. Discoidal cell in forewing with costal side about twice as long as distal side, sharpest angle less than 45° . One to two cells between discoidal cell and subnodus. Ac at about $\frac{1}{4}$ the distance between Ax1 and Ax2 and more than three times as far from arculus as the length of the arculus. Brace vein absent. Pterostigma black; several cells beyond pterostigma divided. Two rows of cells between anal vein and border of wing in Fw and three in Hw. Fields between IR2 and R3, between R3 and IR3, and between IR3 and R4 at distal end containing each 3 or more rows of cells.

Abdomen: S1-2 black, but largely dark brown on dorsal side; S3 largely dark brown becoming darker towards anterior and posterior border and there forming a black ring, S4-7 similar but becoming increasingly dark towards the apex of the abdomen; S8-10 black but mid-dorsally pale brown. The pale brown part of the tergites of S9-10 is only lightly sclerotized and appears wrinkled. The hind border of S10 has only one spine, slightly raised. Anal appendages as in Figures 4e, f. Superiors dark with a paler apex; inferiors black and slightly longer than the very short S10 and about $\frac{1}{4}$ of the length of the superiors. Outer margin of superior appendages with four to five large spines laterally along distal half. Two rounded flanges are present on inner side of appendages just before the slender apex; the lower, larger one starts

slightly beyond the middle of appendages, the upper one starts just beyond $\frac{2}{3}$ of the length of the appendages. The spaces between both ridges is somewhat hollowed out. Penis of holotype male not studied.

Measurements [mm]: Total length 41, abdomen 32, Fw 26; Fw pterostigma 1.9 (costal length), 2.4 (longest length); Hw pterostigma 2.1 (costal length), 2.6 (longest length).

Variation

Adults appear to darken with age and in the adult from Gizo the pattern of head and thorax is more obscured than in the holotype. The other males studied are either semi-adult or teneral and differences between these and the adults are given below.

Head: Labrum of semi-adults and teneral pale yellow-brown; mandibles and genae pale brownish. Remainder of head, including the rear, pale rusty brown with some diffuse darker markings. Sockets and first two segments of antennae dull yellow, other segments brown.

Thorax: Synthorax of semi-adults and teneral brown with pattern of dull yellow markings, which is more extensive than in the holotype (Fig. 4d). The black pattern on the legs is more expressed in the specimens from Vella Lavella than in those from Gizo. Wings with 2 Ax, one specimen has one wing with 3 Ax. Fw with 16-22 Px; Hw with 16-19 Px. Pterostigma white in teneral, yellowish in semi adult and black in adults.

Abdomen: Brown in subadults and teneral with dark brown to black pattern: sides of S1-2 black with dorsal side pale brown, S3-7 with posterior black ring and smaller anterior black ring. Superior and inferior appendages pale brown. In all the males the median part of the tergite of S8-9 is only lightly sclerotized and appears wrinkled. Penis as illustrated (Fig. 4g).

Measurements [mm]: Total length 39-41, abdomen 30-32, Fw 25-26; Fw pterostigma 1.8-2.0 (costal length), 2.4-2.5 (longest length); Hw pterostigma 1.9-2.3 (costal length), 2.5-2.8 (longest length).

Description of female

Head: Coloration and pattern as in male. Like male, becoming increasingly dark on head with age with whitish pattern on the front of the head becoming visible.

Thorax: Coloration and pattern as in male, becoming increasingly dark with age as in male. Legs as in male. Femora of legs with respectively 4, 8, 10-11 spines on the lateral side; tibiae of first pair of legs with 5 larger and 7 smaller spines on the lateral side; tibiae of second and third pair of legs respectively with 10 and 8-9 spines on lateral side. Wings as in male, with 2 Ax but two females with 3 Ax in one or two wings. Fw with 19-20 Px; Hw with 16-17 postnodal veins.

Abdomen: Coloration and pattern as in male and likewise becoming increasingly dark with age. The hind border of S10 has a single slightly raised spine, smaller than that in the male (absent in one female). The length of the cerci is less than twice as long as S9. The brown valvifer is large, projects beyond the cerci and has only small denticles on the ventral side.

Measurements [mm]: Total length 35-38, abdomen 27-29, Fw 25-26; Fw pterostigma 1.5-1.9 (costal length), 2.2-2.5 (longest length); Hw pterostigma 1.8-2.1 (costal length), 2.3-2.6 (longest length).

Argiolestes malaita sp. nov.
(Fig. 5, Plate III d-f)

Etymology

Named after the island where the species occurs. A noun in apposition.

Specimens studied

Holotype ♂: Solomon Islands, Malaita Island, Tagatalau, E of Auki, alt. 200 m, 27 ix 1957, leg. J.L. Gressitt, RMNH, handwritten text with pencil on envelope: "Argiolestes sp. nov. A, Solomon I., Malaita I., Tangtalau, 200m, E of Auki, 27.IX.1957. J.L. Gressitt," small paper glued on the envelope contains the text: "Malaita, Tanatalau, IX-27-51 6."

Diagnosis

The male of *A. malaita* sp. nov. can be distinguished from other males of *Argiolestes* by its large size and its striking rusty orange pattern on the thorax. The pattern on the thorax resembles that of *A. bougainville* sp. nov., in which however the pale colour is azure blue. It is also easily distinguished from *A. bougainville* sp. nov. by the characteristic pattern on the head (Plate IIIe).

Description of holotype male

Head: Anterior $\frac{2}{3}$ of labium black to dark brown, posterior $\frac{1}{3}$ dirty pale brown; wider (2 mm) than long (1.6 mm), median cleft slightly more than $\frac{1}{5}$ of length of labium and about $\frac{2}{3}$ as wide as deep (Fig. 5a). Labrum dull orange with an extensive shining black pattern (Plate IIIe). Mandibles, genae and clypeus dull orange with a shining black stripe on the postclypeus. Remainder of head matt-black with an extensive orange pattern. Sockets of antennae and first two antennal segments orange, remainder of antennae missing. Rear of head black and without prominent occipital lobes.

Thorax: Prothorax laterally orange with some diffuse black markings. Pronotum rusty orange, posterior lobe broad, flat and only slightly raised with rounded corners. Synthorax is black with a rusty orange pattern as in (Plate III f). — Legs with coxae and trochanters orange, some black near knees and traces of black on keels of femora at $\frac{1}{3}$ from base. Spines dark brown. Femora of front leg with five larger and four

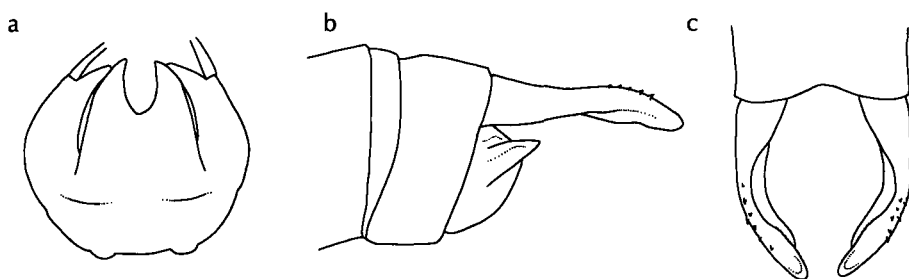


Figure 5: *Argiolestes malaita* sp. nov. ♂, Solomon Islands, Malaita Island — (a) labium; (b) superior anal appendages, lateral; (c) anal appendages, dorsal.

small (orange) spines on lateral side; femora of second and third pair of legs laterally with nine and eleven spines respectively. All spines longer than the space between spines. Tibiae of middle and hind legs both with nine spines on lateral side; these spines near knees are about three times as long as space between spines but become increasingly shorter towards tarsus. — Wings: Fw suffused with pale yellow, Hw hyaline. Venation brown to black. Fw and Hw of equal length. One Fw with 2 and one with 3 Ax, both of them with 21 Px; in Hw 2 Ax and 20-21 Px. Arculus at level of Ax2; discoidal cell in Fw long, costal side about two and half times as long as distal side, most acute angle about 60°. Ac slightly closer to Ax2 than to Ax1 and about twice as far from arculus as length of the arculus. One to two cells between discoidal cell and subnodus. Brace vein present. Pterostigma pale brown. No cells beyond Pt divided. Two rows of cells between anal vein and hind margin of wing. Fields between IR2 and R3, between R3 and IR3, and between IR3 and R4 at distal end containing each 3 or more rows of cells.

Abdomen: S1-6 largely (orange) brown, the posterior 1/6 of each segment darkened; S7-10 darker, brown to black. Hind margin of S10 without spines and slightly depressed in the middle. Anal appendages as in Figures 5b, c. Inferiors simple, slightly shorter than S10 and dark brown. Superiors brown, base covered with minute spines. On lateral side of superior appendages several large spines; on inner side of apex a ridge is present bearing a number (10+) black, blunt denticles. Below this ridge is a second smaller ridge which curves back towards main body of the appendages. The space between the ridges is somewhat hollowed out. The penis was not studied as only the holotype was available.

Measurements [mm]: Total length 56, abdomen 44, Fw 34, Fw pterostigma 1.8 (costal length), 2.4 (longest length); Hw pterostigma 1.9 (costal length), 2.6 (longest length).

DISCUSSION

With 45 species *Argiolestes* is distributed over the Philippines (two), Sulawesi (one), the Moluccas (two), New Guinea and adjacent smaller island (35), the Bismarck Archipelago (one: *A. aurantiacus*), the Solomon Islands (three: *A. bougainville* sp. nov., *A. gizo* sp. nov. and *A. malaita* sp. nov.) and New Caledonia (one). Theischinger (1998) established *Griseargiolestes* and *Miniargiolestes* and re-established *Archioargiolestes* Kennedy, 1925, for the Australian species previously (Watson et al. 1991) included in *Argiolestes*. As stated already in Kalkman (2007) the remaining species of *Argiolestes* will probably have to be split amongst several genera, for which a thorough analysis is needed. For the time being *A. bougainville* sp. nov., *A. gizo* sp. nov. and *A. malaita* sp. nov. are placed in *Argiolestes*. *A. bougainville* sp. nov. and *A. malaita* sp. nov. resemble each other in many respects and are clearly more closely related to each other than to any other *Argiolestes*.

Many species of *Argiolestes* have small areas of distribution and it is therefore likely that *A. bougainville* sp. nov. and *A. malaita* sp. nov. are true endemics of respectively Malaita and Bougainville. It is interesting that *A. gizo* sp. nov. occurs on both Gizo and Vella Lavella (Solomon Islands). The populations from both islands show slight differences in the pattern on the legs, and further study based on more material might show that they in fact represent two species. All specimens of *A. aurantiacus* originate from New Britain and New Ireland, making it likely that this

species is confined to these islands. The fact that even small islands such as Gizo and Vella Lavella support species of *Argiolestes* suggest that the genus may also be present on the other islands of the Solomon Archipelago. A female from Santa Isabel, Hagheulu (Solomon Islands), present in the RMNH, does not seem to belong to any of the described species.

With the three new species the number of species known from the Solomon Archipelago reaches the 62, of which 27 are endemic to the archipelago.

ACKNOWLEDGEMENTS

Steve Richards and Günther Theischinger provided new records of *Argiolestes aurantiacus*. Wolfram Donath and Michael Ohl of the Museum für Naturkunde der Humboldt-Universität Berlin helped me with the loan of the types of *A. aurantiacus*. Bert Orr, Günther Theischinger and Jan van Tol provided valuable comments on the manuscript.

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